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Title: LIQUID APPLICATOR ;

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ABSTRACT:

A liquid applicator for, e.g. liquid shoe polish, has a capsule (18) containing the liquid disposed within, and surrounded entirely by, an enclosure (12, 14). The enclosure is formed of two blocks (12, 14) of foamed plastics glued together along an interface. One block (12) of the enclosure is liquid impervious and relatively rigid, but the other (14) is flexible and porous. The capsule is formed of a thermoformed sheet plastics member (20) having a peripheral flange (30) to which a diaphragm closure is attached. Two reentrant spikes (32) which are integrally formed in the sheet plastics member are capable of puncturing the diaphragm (22) to release the liquid product onto the porous block (14) when the applicator is compressed. The porous material can then be used to brush the liquid onto a surface to be treated.

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(54) Liquid applicator

(57) A liquid applicator for applying, e.g., liquid shoe polish has a capsule 18 containing the liquid disposed within, and surrounded entirely by an enclosure. The enclosure is formed of two blocks 12, 14 of foamed plastics glued together along an interface 16. One block 12 of the enclosure is liquid impervious and relatively rigid, but the other 14 is flexible and porous. The capsule is formed of a thermoformed sheet plastics member having a peripheral flange 30 to which a diaphragm closure 22 is attached. At least one, preferably two, reentrant spikes 32 is/are integrally formed in the sheet plastics member and is/are capable of puncturing the diaphragm to release the liquid product onto the porous block when the applicator is compressed. The porous material can then be used to brush the liquid onto a surface to be treated.

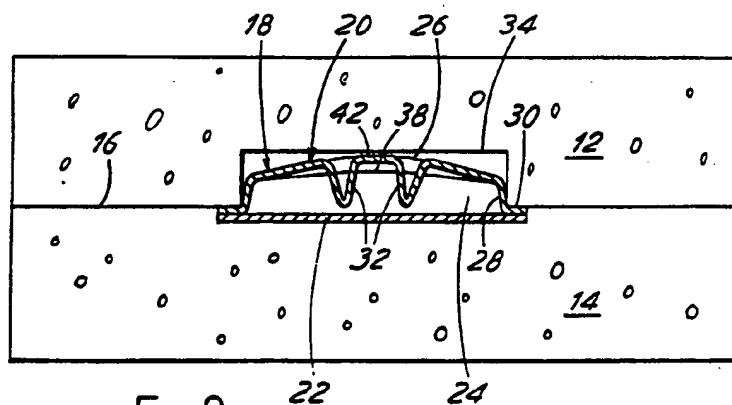


Fig.2

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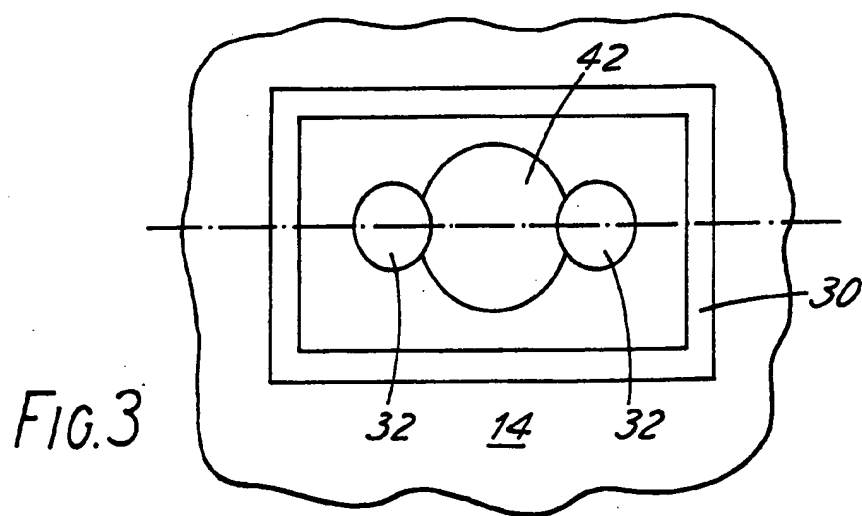
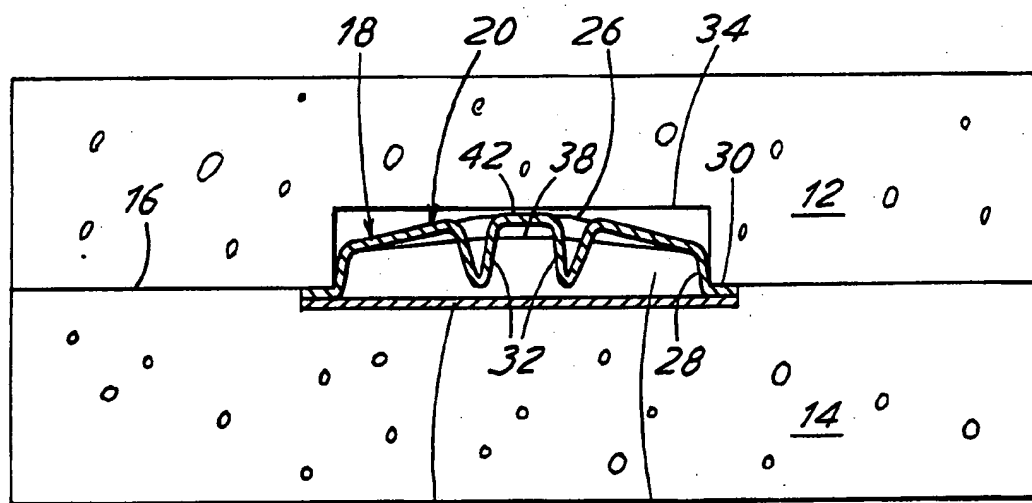
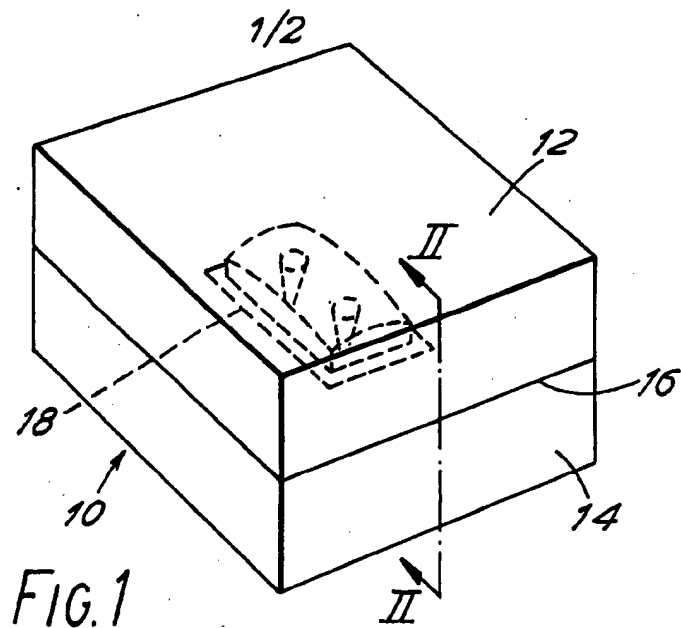


FIG. 4

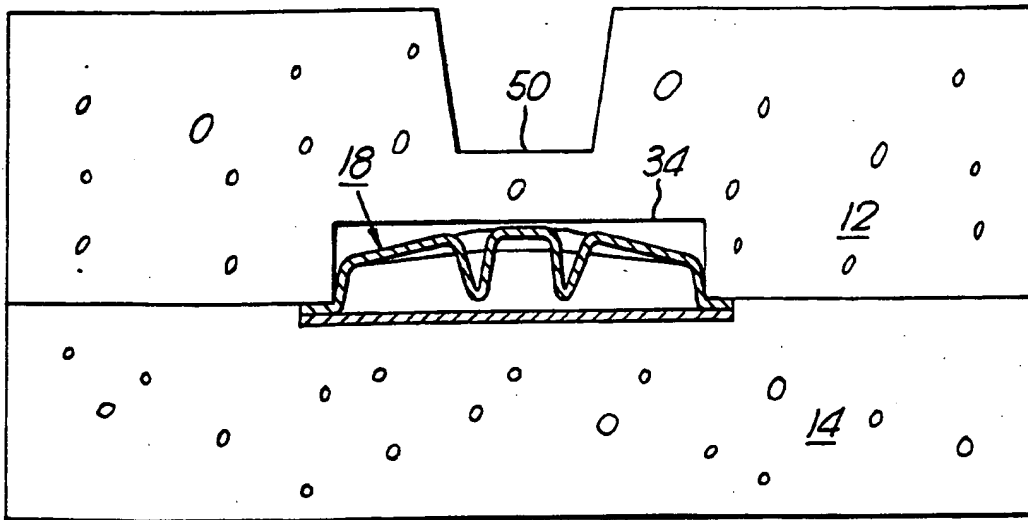
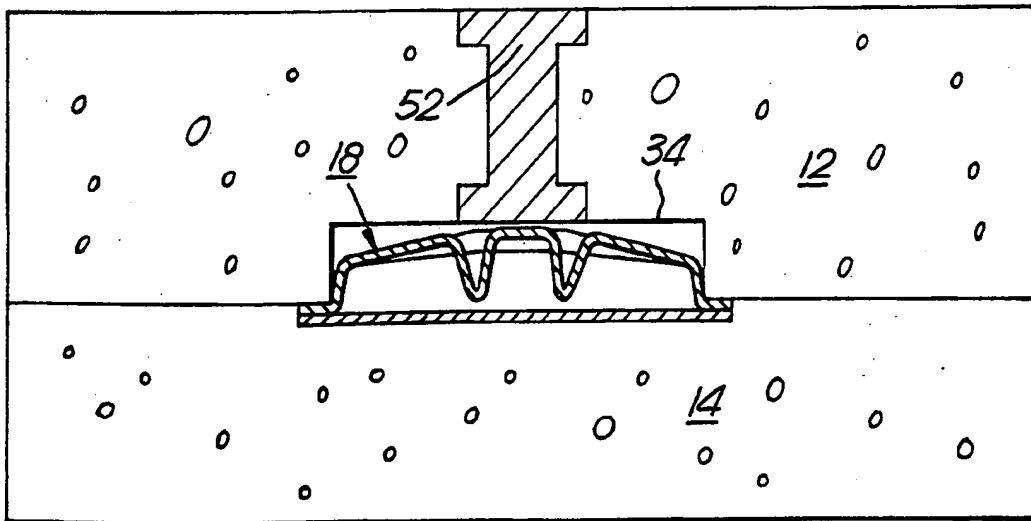


FIG. 5



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LIQUID APPLICATOR

This invention relates to devices for applying a quantity of a liquid to a surface, hereinafter referred to for brevity as "Liquid Applicators". A particular application of the invention is for applying a liquid polish to an article of footwear such as a leather shoe; other applications, however, are possible.

In accordance with the invention a liquid applicator comprises a rupturable capsule containing the liquid to be applied, and an enclosure having a cavity by which the capsule is wholly received and surrounded, the capsule being formed by first and second wall-forming members of which a first is formed with at least one reentrant spike, and the second is peripherally attached to the first and rupturable by the spike when the capsule is compressed, the enclosure comprising a backing member and a porous member attached to the backing member and forming therewith the said cavity, at least the porous member being flexible and the applicator being compressible by the user to cause the spike to rupture the second wall-forming member and thereby allow the said liquid to flow onto the porous member for application thereby onto a surface.

In the described embodiments of the

invention the backing member is generally plane and of substantial thickness and rigidity, and has a recess in which the capsule is received in substantially flush relationship, the porous member being of a flexible, open cell, foamed plastics material and being generally plane and of a substantial thickness, the porous member being bonded to the backing member around the periphery of the capsule.

The invention will be more fully understood from these examples thereof, given with reference to the accompanying drawings, in which:-

Fig. 1 shows, in perspective view, a first liquid polish applicator in accordance with the invention, having upper and lower parts joined along a horizontal interface;

Fig. 2 shows the applicator as seen in central vertical section taken along the line II-II in Fig. 1 and to an enlarged scale;

Fig. 3 shows the capsule of the applicator as seen from above with the upper applicator part removed, and to the same scale as Fig. 2;

Fig. 4 shows the second applicator in a view corresponding to Fig. 2; and

Fig. 5 likewise shows the third applicator in a view corresponding to Fig. 2.

Referring now to Figs. 1 to 3 of the drawings, an applicator 10 for applying a liquid polish to an article of footwear such as a leather shoe is generally cuboid, having upper and lower rectangular parts 12, 14 each of a substantially constant thickness and joined along a plane interface 16. The applicator is shown as it appears when applying polish to a horizontal surface below the applicator; the interface 16 is accordingly horizontal as shown.

Of the two parts of the applicator the upper part 12 is formed of a substantially rigid, closed pore, foamed plastics material such as foamed polyethylene whereas the lower part 14 is formed of a highly flexible and open pore plastics material such as foamed polyether. The two plastics members are bonded to one another at the interface 16 by means of a suitable adhesive (not shown). The upper part 12 may advantageously have greater plan dimensions than the lower part 14 to reduce any tendency for the user to soil his or her fingers. As is variously shown in Figs. 2 and 3, the parts 12, 14 together form an enclosure by which a capsule 18 is received and totally surrounded. The capsule is rectangular in plan view, and formed of upper and lower parts 20, 22 which define between them a chamber 24 within which the liquid polish is contained.

The upper part 20 of the capsule is formed by a thermoforming operation performed upon a suitable relatively rigid sheet material of a thermoplastics polymer resin such as polyvinyl chloride (P.V.C.). It has a generally domed base 26, a tubular wall 28 extending peripherally from the base, and a plane peripheral flange 30 formed around the free edge of the tubular wall. As shown, the capsule part 20 is inverted and its base 26 is therefore uppermost.

The lower part 22 of the capsule is rupturable (as will become apparent) and made of a suitable thin but liquid-impermeable material such as aluminium foil with a plastics coating to render it heat-sealable to the capsule upper part. It is plane, and heat-sealed to the peripheral flange 30 of the capsule upper part 20 so as to form a diaphragm closure by which the liquid polish is held within the

capsule upper part.

As can particularly be understood from Fig. 2, the capsule 18 is largely received and located in a recess 34 formed in the upper applicator part 12, with its flange 30 lying against the undersurface of the part 12 and carrying the diaphragm closure 22 beneath it. The combined thickness of the flange and diaphragm closure is small, so that these items are accommodated by local deformation of the material of the lower applicator part 14 within the interior of the applicator.

The domed base 26 of the capsule upper part 20 is formed by the thermoforming operation with two spaced, hollow spikes 32. Each spike extends in a reentrant manner downwardly into the interior of the capsule, so as to terminate at a relatively sharp point which is separated from the diaphragm closure 22 by a small clearance. This clearance is sufficient to prevent inadvertent operation of the applicator during normal handling and display to the point of use.

The domed base 26 is generally of shallow frustoconical form, and attached to the tubular wall 28 along upwardly domed upper edges 38 of the four side panels of the latter. The spikes 32 are carried by the base one on each side of a generally circular flat or plateau 42 which forms the centre of the base. They are aligned along the major axis of the capsule, as shown.

The spikes 32 are identical and conveniently of right-conical form. They are formed symmetrically in relation to the plateau 42, their purpose and function being to puncture the diaphragm closure 22 when the applicator is pressed against the surface to be treated.

When the applicator is compressed for use,



each spike 32 creates an opening in the diaphragm closure, the two holes allowing the liquid polish to leave the capsule and pass through the porous member 14 and onto the surface to be treated. The applicator  
5 can then be brushed along the surface to distribute the polish as desired.

The movement of the spikes to form the openings in the diaphragm closure is created by eversion of the base 26 from a stable, upwardly domed  
10 condition to a downwardly domed condition, in which it is again stable. The volume available within the capsule for the liquid is therefore rapidly reduced, and substantially all the liquid contents are quickly and positively expelled for dispensing. The provision  
15 of two spikes further assists the liquid to leave the capsule by ensuring that one opening is available in the diaphragm closure 22 through which air can pass to replace liquid polish leaving via the other opening. Also, the spikes are constrained to move not only  
20 longitudinally (i.e. downwardly) but also with a mutually divergent swinging action. The openings in the diaphragm closure are therefore enlarged and cannot be obturated by the spikes.

Figure 4 shows a second liquid polish  
25 applicator which has the same construction as the applicator described above; the same reference numerals as before are therefore generally used to indicate like parts. The second applicator differs from the first in that the upper part 12 of the  
30 enclosure is increased in depth in relation to the depth of the lower part, so as to reduce any tendency for the user to soil his or her fingers. To facilitate the rupturing of the capsule 18, the upper part 12 is formed with a blind hole 50 which is  
35 located above the capsule and into which the user can

insert a finger to exert pressure on the capsule.  
Figure 5 shows a third applicator which, like the  
applicator of Fig. 4, has its upper part 12 of  
increased relative depth. In this embodiment  
5 operation of the applicator is facilitated by a rigid  
button 52 which is incorporated into the upper part  
12 of the enclosure so as to transmit to the capsule  
18 finger pressure which is exerted by the user on the  
upper surface of the enclosure. Typically, the button  
10 is moulded from (unfoamed) polyethylene.

The button 52 and the blind hole 50 (Fig. 4)  
enable the upper part 12 of the enclosure to have the  
optimum depth for user convenience and ease of  
operation.

15 Whilst of particular application to one-trip  
liquid polish applicators as particularly described  
above, the invention is not so limited but may be used  
in many situations where it is desired to distribute a  
liquid over a surface. In contrast with the described  
20 embodiment it may sometimes be of advantage to  
restrict the flow of the liquid from the capsule. For  
this and other reasons it may therefore be sufficient  
or desirable for only one spike to be provided instead  
of two, and/or for the base of the capsule to be  
25 arranged so that the or each spike is returned to its  
original position after operation. The base may  
therefore be plane (for example), rather than upwardly  
domed as shown. In a non-illustrated form of the  
invention the capsule is cylindrical, its base being  
30 plane and perpendicular to the capsule axis; a single  
spike is formed in the base and centered on the axis.

CLAIMS:-

1. A liquid applicator, which comprises a rupturable capsule containing the liquid to be applied, and an enclosure having a cavity by which the capsule is wholly received and surrounded, the capsule being formed by first and second wall-forming members of which a first is formed with at least one reentrant spike, and the second is peripherally attached to the first and rupturable by the spike when the capsule is compressed, the enclosure comprising a backing member and a porous member attached to the backing member and forming therewith the said cavity, the porous member being flexible and the applicator being compressible by the user to cause the spike to rupture the second wall-forming member and thereby allow the said liquid to flow onto the porous member for application thereby onto a surface.

2. A liquid applicator according to claim 1, wherein the backing member is generally plane and of substantial thickness and rigidity, and has a recess in which the capsule is received in substantially flush relationship, the porous member being of a flexible, open cell foamed plastics material and being generally plane and of a substantial thickness, the porous member being bonded to the backing member around the periphery of the capsule.

3. A liquid applicator according to claim 2, wherein the backing member is of a substantially rigid, closed cell, foamed thermoplastics material.

4. A liquid applicator according to claim 3, wherein the backing member is of foamed polyethylene.

5. A liquid applicator according to any claim

of claims 2 to 4, wherein the backing member is formed into a blind hole in correspondence with the capsule.

5           6.           A liquid applicator according to any claim of claims 2 to 4, wherein a force transmitting button is incorporated into the backing member in correspondence into the capsule.

10           7.           A liquid applicator according to any one of claims 2 to 7, wherein the porous member is of foamed polyether.

15           8.           A liquid applicator according to any preceding claim, wherein the first wall-forming member of the capsule is thermoformed from a sheet thermoplastics material to have a base, a tubular wall extending peripherally from the base, and a plane flange carried by the free edge of the tubular wall, the base having the said at least one spike formed  
20           integrally therewith, and the second wall-forming member of the capsule being plane and formed from a liquid-impermeable sheet material which is heat-sealed as a diaphragm closure to the flange of the first wall-forming member.

25           9.           A liquid applicator according to claim 8, wherein the first wall-forming member of the capsule is thermoformed from polyvinyl chloride sheet.

30           10.          A liquid applicator according to any preceding claim, wherein the first wall-forming member of the capsule is deformed to a stable everted condition to cause the or each spike to rupture the second wall-forming member.

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11. A liquid applicator according to any preceding claim, arranged for the or each spike to move both longitudinally and with a swinging motion to rupture the second wall-forming member.

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12. A liquid applicator, substantially as hereinbefore described with reference to the accompanying drawings.

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